Commonwealth of Kentucky
Division for Air Quality

PERMIT STATEMENT OF BASIS

DRAFT
Title V, Operating Permit: V-07-010
General Shale Brick, Inc.
Corbin, KY 40702
February 19, 2008
Robert L. Williams, Reviewer

SOURCE ID:	21-235-00022
SOURCE A.I. #:	4204
ACTIVITY ID:	APE20040001

SOURCE DESCRIPTION:

On March 21, 2003, General Shale Products, LLC (now General Shale Brick, Inc.) submitted a Title V Operating Permit renewal application to the Division. Revisions to the permit application were received by the Division on June 28, 2004 and November 21, 2005. General Shale Brick, Inc. operates a face brick manufacturing plant (Plant #33) adjacent to State Highway 26, 22 miles south of Corbin at Woodbine, Kentucky. The primary SIC code for this facility is 3251.

Initial processing of the raw material, consisting of a combination of clay and shale, takes place in a large building housing storage piles, hoppers, a primary crusher, a secondary crusher, screens, and associated conveyors. After secondary crushing, the raw material is mixed with sand and water and formed into bricks by an extrusion process. The bricks are then dried and vitrified in two natural gas fired tunnel dryer/kilns. Kiln A was installed in 1972 and modified to burn coal in 1982. Kiln B was installed in 1986. Coal is no longer used as fuel for either kiln.

The potential to emit, as defined in 401 KAR 52:001, Section 1 (56), of particulate matter with a diameter of less than 10 micrometers (PM-10), carbon monoxide (CO), and sulfur dioxide (SO_2) for this source are each greater than one hundred (100) tons per year. Additionally, the potential to emit of a single hazardous air pollutant (HAP) and the combined HAPs for this source are greater than 10 and 25 tons per year, respectively. Therefore, the source is a major source under the Title V permitting program, 401 KAR 52:020.

In order to preclude applicability of 401 KAR 59:105, *New Gas Process Streams*, the source has taken voluntary production limits on the two tunnel kilns, identified as Kiln A and Kiln B, such that the emissions of SO_2 are limited to less than 100 tons per year. Such limits were included in initial Title V Permit No. V-99-002, issued May 5, 2000. Additionally, in order to remain below those limits listed in 401 KAR 53:010, *Ambient Air Quality Standards*, for gaseous fluorides (HF) the source has requested to take voluntary production limits on the tunnel kilns such that the hourly rate of brick production will not exceed 7.5 tons per hour, per kiln. Federally enforceable restrictions are included in the permit renewal for the two tunnel kilns to limit emissions and production below the applicability thresholds of 401 KAR 59:105 and 401 KAR 53:010. After incorporation of these federally enforceable restrictions, emissions of PM-10, CO and HAPs are greater than Title V major source thresholds. Therefore, the source will be issued a Title V Operating Permit renewal under 401 KAR 52:020, Title V Permits.

COMMENTS:

Existing Approvals:

The following prior approvals and approval requests have been considered during this permit review:

(a) A revision to the Title V Operating Permit renewal application was received by the Division on June 28, 2004. In this submittal General Shale Products, LLC indicated that the company's name had been changed to General Shale Brick, Inc. effective July 1, 2004. Additionally, the source indicated that they would like to replace the existing McClanahan crusher and two grinders with a Steadman GS 4260 crusher. This request is incorporated into the permit renewal.

(b) A revision to the Title V Operating Permit renewal application was received by the Division on November 21, 2005. In this submittal General Shale Brick, Inc. requested to take voluntary production limits on the tunnel kilns such that the hourly rate of brick production is less than 10 tons per hour, per kiln. A review of the modeling information revealed that a voluntary production limit of no more than 7.5 tons per hour, per kiln, would be necessary to avoid exceeding the ambient air quality standard for gaseous fluoride (HF), as listed in 401 KAR 53:010. This request is incorporated into the permit renewal.

Type of Control and Efficiency:

Control of fugitive particulate emissions from raw material handling including inside stockpiles, inside truck loadout, hoppers/feeders, conveying, crushing, and screening, is accomplished by enclosure of equipment in a large building and by processing wet material instead of dry material. An efficiency of ninety percent (90%) is assigned for this type of control. Application of water to the haul road and the yard area is given an efficiency of seventy percent (70%). Outside stockpiles, and truck loading is given an efficiency of ninety percent (90%). No controls exist for the tunnel kilns.

Emission Factors and Their Source:

A sulfur dioxide (SO_2) emission factor of 1.06 pounds of SO_2 per ton of bricks produced was established through a stack test performed for Kilns A and B on October 2, 1998 and approved by the Division. This emission factor was used to calculate the potential to emit for sulfur dioxide (SO_2) from the two kilns. U.S. EPA AP-42, Chapter 11.3 emission factors were used to calculate the potential to emit, excluding SO_2, from the two kilns. U.S. EPA AP-42, Chapter 11.3 emission factors were also used to calculate the potential to emit of PM for primary crushing operations, secondary crushing operations, and screening operations. U.S. EPA AP-42, Chapter 11.19.2 emission factors were used to calculate the potential to emit of PM for conveying operations. The emission factors used to calculate the potential to emit of PM for the receiving hopper and the Meco feeder, raw material stockpiles and loadout operations are standard emission factors used by the Division for Air Quality's Mineral Section for crushed and broken stone. The emission factor for calculating the potential to emit of PM for unpaved haul roads was obtained from a standard equation used by the Division for Air Quality's Mineral Section in regards to all unpaved haul roads greater than 0.25 mile.

Refer to the detailed POC table emission calculations.

COMMENTS: (CONTINUED)

Applicable Regulations:

(a) 401 KAR 59:010, *New Process Operations*

Pursuant to 401 KAR 59:010, Section 1, the requirements of this rule apply to each affected facility, associated with a process operation, which is not subject to another emission standard, with respect to particulate matter (PM), in 401 KAR Chapter 59 and which commenced on or after July 2, 1975. The requirements of this rule are included in the permit for the following emission units:

1. Kiln A (EP 02); and
2. Kiln B (EP 04).

Mass Emission Limits pursuant to 401 KAR 59:010 Section 3(2):
For processing rates of 1000 lbs/hr or less, the allowable PM emission rate is 2.34 lbs/hr.
For process rates greater than or equal to 1,000 lbs/hr but less than 60,000 lbs/hr, the allowable emissions of particulate matter (pounds per hour) shall not exceed:
$3.59 * (\text{Process Weight Rate (tons per hour)})^{0.62}$

Kiln A:
Allowable Particulate (PM) Emission Rate (lbs/hr) =
$3.59 * (\text{Process Weight Rate (tons/hr)})^{0.62} =$
$3.59 * (10.9)^{0.62} = 15.79$ lbs PM/hr

Kiln B:
Allowable Particulate (PM) Emission Rate (lbs/hr) =
$3.59 * (\text{Process Weight Rate (tons/hr)})^{0.62} =$
$3.59 * (14.4)^{0.62} = 18.76$ lbs PM/hr

401 KAR 59:010, Section 2(2) defines "Process Weight Rate" as the total weight of all materials introduced into any affected facility which may cause any emission of particulate matter, but does not include liquid and gaseous fuels charged, combustion air, or uncombined water. The allowable particulate emission rates calculated above were based on the maximum brick production rate (tons/hr) rather than on the maximum kiln input rates (Kiln A = 13.0 tons/hr and Kiln B = 17.3 tons/hr) because the kiln drying process involves removal of uncombined water from the mineral products. For that reason, the uncombined water was not included in the process weight rate used to calculate the allowable particulate matter emission rate.

COMMENTS: (CONTINUED)

Applicable Regulations: (Continued)

(b) 401 KAR 63:010, *Fugitive Emissions*
Pursuant to 401 KAR 63:010, Section 1, the requirements of this rule apply to an apparatus, operation, or road which emits or may emit fugitive emissions provided that the fugitive emissions from such facility are not elsewhere subject to an opacity standard within the administrative regulations of the Division for Air Quality. Therefore, the requirements of 401 KAR 63:010 are applicable to the following emission units:

1. Raw Material Handling (EP 01) including:
   i. Stockpile [Feed Material Storage Pile (Outside)] (01);
   ii. Truck Loadout [From Feed Material Storage Pile (Outside) to Building] (02);
   iii. Stockpile [Feed Material Storage Pile (Inside)] (03);
   iv. Truck Loadout [From Feed Material Storage Pile (Inside) to Receiving Hopper and Meco Feeder] (04);
   v. Receiving Hopper and Meco Feeder (05);
   vi. Conveyor and Transfer Point (From Receiving Hopper to Primary Crusher) (06);
   vii. Conveyor and Transfer Point (From Primary Crusher to Secondary Crusher) (08);
   viii. Screens (6) (Leahy 4x10) (11); and
   ix. Conveyor and Transfer Point (From Screens to Brick Mixer/Extruder) (12).

2. Haul Roads (Unpaved) and Yard Area (EP 03).

(c) 40 CFR 60, Subpart OOO, *Standards of Performance for Nonmetallic Mineral Processing Plants*
The requirements of 401 KAR 60:670, *New Nonmetallic Mineral Processing Plants*, incorporating by reference 40 CFR 60, Subpart OOO, *Standards of Performance for Nonmetallic Mineral Processing Plants*, are applicable to the following affected facilities in fixed or portable nonmetallic mineral processing plants: each crusher, grinding mill, screening operation, bucket elevator, belt conveyor, bagging operation, storage bin, enclosed truck or railcar loading station, which commenced construction after August 31, 1983.

The requirements of this rule are not included in the permit for the hopper and feeder [EP 01(1)], screens [EP 01(5)], and conveyors [EP 01(-)] because these units were constructed in 1972, which is before the applicability date of August 31, 1983.

COMMENTS: (CONTINUED)

Applicable Regulations: (Continued)

(c) The Steadman (primary) crusher [EP 07(-)] was installed in 2004 and the secondary crusher [EP 05(4)] and the slider belt conveyor [EP 06(-)] were installed in 1993. Each of these units was installed after the August 31, 1983 rule applicability date. Therefore, these three emission points are subject to the requirements of 40 CFR 60, Subpart OOO, as modified at 401 KAR 60.670

40 CFR 60.670(e) indicates that if any transfer point on a conveyor belt or any other affected facility is enclosed in a building, then each enclosed affected facility must comply with the particulate emission limits in 40 CFR 60.670(a), (b), and (c), or the building must comply with specific emission limits under 40 CFR 60.670(e)(1) and (2). The primary crusher, secondary crusher and the slider belt conveyor are not subject to the particulate matter standards in 40 CFR 60.670(a) as specified in 40 CFR 60.670(e) because the building enclosing the affected facilities is not equipped with exhaust vents or stacks. As such, the particulate emission limits in 40 CFR 60.670(a) are not included in the permit for the affected facilities. The applicability determination for the secondary crusher and the slider belt conveyor is consistent with that made by the division during the initial Title V Permit review.

The one (1) McClanahan crusher [previously EP 01(02)], with a maximum capacity of 125 tons per hour, and two (2) grinders [previously EP 01(03)], with a maximum capacity of 125 tons per hour, were exempt from the requirements of 40 CFR 60, Subpart OOO because these units were installed in 1972, which was before the applicability date of this NSPS (August 31, 1983). In 2004 the McClanahan crusher and the two grinders were removed from the plant. In 2004 the source installed a Steadman crusher [EP 07(-)], with a maximum capacity of 200 tons per hour, to perform comparable operations as the McClanahan crusher and two (2) grinders. 40 CFR 60.670 paragraph (d) contain provisions for a facility that replaces an existing exempt facility if:

(1) The existing facility is replaced by a piece of equipment of equal or smaller size, having the same function as the existing facility, except the owner or operator must comply with the reporting requirements of 40 CFR 60.676 (a) and (b).

COMMENTS: (CONTINUED)

Applicable Regulations: (Continued)

(c) Based on a 1987 document from the U.S. EPA, Region 5, titled "NSPS Applicability to Crushers", when two smaller crushers are replaced with one larger crusher, as is the case here, the new crusher becomes an affected facility subject to 40 CFR 60, Subpart OOO. The fact that the larger crusher has the same capacity as the sum of the two smaller ones does not exempt it. The document also indicates that the exemption under 40 CFR 60.670 (d) for a crusher of same or smaller capacity applies only for a crusher-for-crusher replacement and not a crusher-for-crushers replacement. Based on the provisions of 40 CFR 60.670 (d), since the Steadman crusher, installed in 2004, has a greater capacity (200 tons per hour) than the McClanahan crusher (125 tons per hour), the Steadman crusher is not exempt from the requirements of 40 CFR 60, Subpart OOO and therefore must comply with the provisions of this rule. Additionally, even though the Steadman crusher has an operating capacity that is equal to the McClanahan crusher because of a bottleneck in the raw material processing line, the provisions under 40 CFR 60.670(d) which exempt like-like replacements of existing facilities are based on the design capacity and not on an operating limitation (i.e. bottleneck). Therefore the requirements of 40 CFR 60, Subpart OOO apply to the Steadman crusher.

401 KAR 60:670 adopts the requirements of 40 CFR 60, Subpart OOO (40 CFR 60.670 to 60.676) by reference, and establishes alternate compliance standards in lieu of 40 CFR 60.672 for particulate matter. The requirements of this rule are included in this permit for the equipment specified above, as applicable.

Non-Applicable Regulations:

(a) The requirements of 401 KAR 59:050, *New Storage Vessels for Petroleum Liquids*, are not included in the permit for the 2,000 gallon diesel fuel storage tank because diesel fuel is not considered a petroleum liquid, pursuant to 40 KAR 59:050 Section 2 (3). Additionally, this rule does not apply to the 1,000 gallon gasoline storage tank because this source is not located in an area designated as nonattainment for the ozone standard and this source is not a major source of volatile organic compounds (VOCs).

(b) The requirements of 40 CFR 60, Subpart Kb, *Standards of Performance for Volatile Organic Liquid Storage Vessels*, are not included in the permit for 2,000 gallon diesel fuel storage tank and the 1,000 gallon gasoline storage tank because the capacity of each tank is less than the rule applicability threshold of 75 cubic meters (m^3).

(c) The requirements of 40 CFR 60, Subpart UUU, *Standards of Performance for Calciners and Dryers in Mineral Industries*, as adopted by reference at 401 KAR 60:005, are not applicable to this source. For the brick and related clay products industry, this rule applies only to calcining and drying of raw materials prior to brick firing. Pursuant to 40 CFR 60.730(b), tunnel kilns used to dry materials in a Mineral Processing Plant are not subject to the provisions of 40 CFR 63, Subpart UUU.

COMMENTS: (CONTINUED)

Non-Applicable Regulations: (Continued)

(d) The requirements of 40 CFR 64, *Compliance Assurance Monitoring,* apply to emission units which have potential pre-control emissions for a regulated pollutant at 100 percent of the applicable major Title V threshold, and uses a control device to achieve compliance with an emission limitation or standard. No emission unit at this source meets these applicability criteria.

EMISSION AND OPERATING CAPS DESCRIPTION:

(a) A stack test was performed on October 2, 1998 at the request of the Division to determine applicability of Regulation 401 KAR 59:105, *New Process Gas Streams*, for the two tunnel kilns (Kiln A and Kiln B). The results of the test determined an emission factor of 1.06 pounds of SO_2 per ton of brick produced. At 8,760 hours of operation, the emission factor indicated potential emissions of sulfur dioxide that exceed 100 tons per year, making the two kilns subject to Regulation 401 KAR 59:105, Section 4. The stack test results show that the kilns are able to comply with the sulfur dioxide concentration standard of 250 ppm, under 401 KAR 59:105. As such, General Shale Brick, Inc. requested a total annual production limit for the two kilns to preclude applicability of 401 KAR 59:105. A total annual (consecutive 12-months) production limit of 180,000 tons of bricks from both kilns was established in initial TV No. V-99-002. At this rate of production, sulfur dioxide emissions are limited to less than 100 tons per year, thus exempting both kilns from Regulation 401 KAR 59:105. This operating cap notwithstanding, the brick production at each kiln is also limited to less than 10 tons per hour (see paragraph (b) below). At 8,760 hours of operation, this equates to less than 175,200 tons per year. Therefore, compliance with the hourly production limit shall ensure compliance with the annual operating cap of 180,000 tons of bricks per year.

(b) In order to avoid exceeding the ambient air quality standard for gaseous fluoride (HF), as listed in 401 KAR 53:010, the maximum hourly brick production rate for Kilns A and B will not exceed 7.5 tons per hour, each.

PERIODIC MONITORING:

(a) The Permittee is required to perform daily visible emission observations, during plant operations, to determine if fugitive dust from the raw material handling equipment, haul roads, storage piles, and/or loading and unloading is being generated in such an amount or manner as to cause a nuisance or to cross the property line.

(b) The Permittee is required to perform visible emission observations at least once per operating day for the two tunnel kilns (Kiln A and Kiln B).

PERIODIC MONITORING: (CONTINUED)

(c) The Permittee is required to perform U.S. EPA Reference Method 9, along with other methods and procedures in 40 CFR 60.675, for the primary crusher [EP 07(-)], the secondary crusher [EP 05(4)], and the slider belt conveyor [EP 06(-)]. The permittee is required to perform visible emission observations at least once per operating day for these emission units.

(d) A log of daily brick production rates and the daily hours of operation for each of the two kilns (Kiln A and Kiln B) shall be kept available at the facility to demonstrate compliance with the brick production limits required in order to preclude applicability of 401 KAR 59:105, *New Process Gas Streams* and avoid exceeding the ambient air quality standard for gaseous fluoride (HF), as listed in 401 KAR 53:010.

OPERATIONAL FLEXIBILITY:

There are no alternative operating scenarios proposed in this permit.

CREDIBLE EVIDENCE:

This permit contains provisions which require that specific test methods, monitoring or recordkeeping be used as a demonstration of compliance with permit limits. On February 24, 1997, the U.S. EPA promulgated revisions to the following federal regulations: 40 CFR Part 51, Sec. 51.212; 40 CFR Part 52, Sec. 52.12; 40 CFR Part 52, Sec. 52.30; 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12, that allow the use of credible evidence to establish compliance with applicable requirements. At the issuance of this permit, Kentucky has only adopted the provisions of 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12 into its air quality regulations.